AF

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT	:	Yong Yan		
SERIAL NO.	:	09/922,142	EXAMINER	: Allen C. Wong
FILED	:	August 3, 2001	ART UNIT	: 2613
FOR	:	AUTOMATED MASK SELECTION IN OBJECT-BASED VIDEO ENCODING		

APPEAL BRIEF TRANSMITTAL LETTER

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA. 22313-1450

Dear Sir:

Appellants respectfully submit three copies of a Brief For Appellants that includes an Appendix with the pending claims. The Appeal Brief is now due on March 12, 2005 and is being filed on Monday, March 14, 2005 as March 12, 2005 fell on a Saturday.

Appellants enclose a check in the amount of $500.00 covering the requisite Government Fee.

Should the Examiner deem that there are any issues which may be best resolved by telephone communication, kindly telephone Applicants undersigned representative at the number listed below.

Respectfully submitted,
Russell Gross
Registration No. 40,007

By: Steve Cha
Attorney for Applicant
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Date: March 14, 2005

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Steve Cha, Reg. No. 44,069
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(Signature and Date)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Before the Board of Patent Appeals and Interferences

In re the Application

Inventor	:	**Yong Yan**
Application No.	:	**09/922,142**
Filed	:	**August 3, 2001**
For	:	**AUTOMATED MASK SELECTION IN OBJECT BASED VIDEO ENCODING**

APPEAL BRIEF

On Appeal from Group Art Unit 2613

Russell Gross
Registration No. 40,007

Date: March 14, 2005

By: Steve Cha
Attorney for Applicant
Registration No. 44,069

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Steve S. Cha, Reg. No. 44,069
(Name of Registered Representative)

(Signature and Date)

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TABLE OF CASES

I. REAL PARTY IN INTEREST

The real party in interest is the assignee of the present application, U.S. Philips Corporation, and not the party named in the above caption.

II. RELATED APPEALS AND INTERFERENCES

With regard to identifying by number and filing date all other appeals or interferences known to Appellant which will directly effect or be directly affected by or have a bearing on the Board's decision in this appeal, Appellant is not aware of any such appeals or interferences.

III. STATUS OF CLAIMS

Claims 1-28 have been presented for examination. All of these claims are pending, stand finally rejected, and form the subject matter of the present appeal.

IV. STATUS OF AMENDMENTS

The Amendment after the Final Office Action containing claims 1-28 filed November 12, 2004 has been entered.

A first Office Action was mailed on March 3, 2004. Claims1-5, 7-15, 17-24 and 26-28 were rejected under 35 USC §102(e) as being anticipated by Chen (USP no. 6,208,693). Claims 6, 16, and 25 were rejected under 35 USC 103(a) as being obvious over Chen in view of Sekiguchi (USP no. 6,611,628). On June 28, 2004, a response to the first Official Action was filed which presented arguments why the references cited failed to anticipate or render obvious the claimed invention. No amendments were made

to the claims. On September 28, 2004, a second and Final Office Actions was entered, which again rejected claims 1-5, 7-15, 17-24 and 26-28 as being anticipated by Chen and claims 6, 16 and 25 were rejected as being obvious in view of the combination of Chen and Sekiguchi. A Response After Final Office Action was filed on November 10, 2004, which presented additional arguments as to why the claimed invention was not anticipated or rendered obvious by the recited references. No amendments were made to the claims. An Advisory Action, having a mailing date of December 29 2004, was entered into the file and stated that the arguments did not place the application in condition for allowance. A Notice of Appeal, with appropriate fee, was filed on January 12, 2005.

V. SUMMARY of the CLAIMED SUBJECT MATTER

The present invention provides a method and a system for dynamically selecting a mask type (Figure 1, items 17, 19, 21) based on characteristics such as coded shape, texture and motion information of an object in an image (see page 3, line 18- page 4, line 3). In a one aspect, the invention provides a video object encoding system (Figure 1, item 10), comprising an object evaluation system (Figure 1, item12) that evaluates a video object using a predetermined criterion and a mask generation system (Figure 1, item 14) that generates one of a plurality of mask types (Figure 1, items 17, 19, 21) for the video object (Figure 1, item 27) based on the evaluation of the video object (see page 4, lines 7-16). In order to capture video objects in the alpha plane for encoding, shape masks are used that match or approximate the shape of the object. The mask generation system may select the mask used from mask types such as; a pixel-based mask (Figure 1, item17) that is an arbitrary shape closely matching the object on a pixel level; a bounding

box (Figure 1, item 19) that bounds the object shape (e.g., a rectangle); or a macroblock-based mask (Figure 1, item 21). (see page 4, lines 7-23).

VI. GROUNDS of REJECTION to be REVIEWED ON APPEAL

The issues in the present matter are whether:

1. claims 1-5, 7-15, 17-24 and 26-28 are anticipated under 35 USC §102(e) by Chen; and

2, claims 6, 16 and 25 are obvious under 35 USC §103(a) in view of the combination of Chen and Sekiguchi.

VII. ARGUMENT

I. Rejection of Claims 1-5, 7-15, 17-24 and 26 Under 35 USC §102(e) in view of Chen

Claims 1-5, 7-15, 17-24 and 26-28 stand rejected under 35 USC §102(e) as being anticipated by Chen (USP No. 6,208,693). The Final Office Action states that all of the elements of the claimed invention are disclosed by Chen.

Difference Between the Claimed Invention and the Primary Reference – Chen

The instant invention, as recited in claim 1, which is typical of the remaining independent claims, discloses an encoding system, comprising an object evaluation system that evaluates a video object using a predetermined criterion and a mask generation system that generates one of a plurality of mask types for the video object based on the evaluation of the video object.

Chen discloses a system for encoding video objects by first defining a bounding box and then determining the shape of the video object within the bounding box. More

specifically, Chen states that the "shape mask generator 249 compares each pixel value (in the reconstructed pixel signal) [in the bounding box] to the chroma-key value (or a range of values near the chroma-key color). By comparing the pixels values to the chroma-key value the shape mask generator 249 can determine which pixels are located within the object and which pixels are located outside the object and thereby identify the original shape of the object in the VOP." (see col. 6, lines 37-44).

The process of Chen is more fully disclosed with regard to Figure 5, which illustrates a flow chart of the operation of an encoding system according to an embodiment of the Chen device. Chen further discusses the operation of the process in col. 9, lines 54-col. 10, line 57. More specifically, at step 510 a video frame is received and at step 515 a bounding box is created around the video object. "At step 525, within the bounding box, each macroblock formatted [sic] and is identified as either: 1) outside the video object; 2) inside the object; or 3) on the object boundary." Accordingly, Chen uses a bounding box to isolate the object and then determines the shape of the object by evaluating the object within the bounding box.

Chen Fails to Anticipate the Claimed Invention

The Final Office Action in rejecting the claims states that "the 'mask generation', Chen's col. 6, line 47-52, (which state, in part,"[a]lso, color extractor and shape mask generator 249 generates and outputs a shape mask identifying the shape of the video object. The shape mask can be generated as a binary map ... or a gray scale map identifying whether each pixel is either inside or outside the video object") discloses that masks can be generated for the video object based on the position of the location of the pixel relative to the video object."

"Anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, *arranged as in the claim.*" Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co., 221 USPQ 481, 485 (Fed. Cir. 1984) (emphasis added).

Contrary to the positions stated in the Final Office Action, Chen fails to disclose each and every element recited in claim 1. As noted above, Chen teaches a system for generating the shape mask as the object shape within a bounding box that isolates the object from the other objects in the image.

Chen fails to teach "a mask generation system that generates one of a plurality of mask types for the video object based on the evaluation of the video object," as is recited in claim 1. Hence, rather than evaluating the object to determine the type of mask, Chen teaches using a bounding box and generating the object shape within the isolating box based on evaluating the object. Nowhere does Chen disclose generating "one of a plurality of mask types based on the evaluation of the object" as is recited in claim 1.

Accordingly, Chen cannot be said to anticipate the invention recited in claim 1 as Chen fails to disclose each and element claimed.

In view of the above, applicant submits that claim 1 is patently distinguishable and patentable over the teaching of Chen.

With regard to independent claims 11 and 20, these claims recite subject matter similar to that recited in claim 1 and have been rejected for the same reason used to reject claim 1. However, claims 11 and 20 each disclose the element "a mask generation system that generates one of a plurality of mask types for the video object based on the evaluation of the video object," which is recited in claim 1. Accordingly, claims 11 and

20 include subject matter not disclosed by Chen and, thus, for the same remarks made with regard to claim 1, which are reasserted, as if in full herein, applicant submits that these claims are also patently distinguishable and allowable over the teachings of Chen.

With regard to dependent claims 2-5, 7-10, 12-19, 21-24 and 26-28, these claims depend from independent claims 1, 11 and 20, respectively, which have been shown to be patently distinguishable over the cited reference. Accordingly, these claims are also patently distinguishable and allowable over Chen by virtue of their dependency upon an allowable base claims.

In view of the above, applicant submits that all of the above referred-to claims are patentable over the teachings of Chen.

II. Rejection of claims 6, 16 and 25 Under 35 USC §103(a) in view of Chen and Sekiguchi

Claims 6, 16 and 25 stand rejected under 35 USC §103(a) as being obvious in view of combination of Chen and Sekiguchi. The Final Office Action states that "Chen discloses an object evaluation system ... using predetermined criterion. ... Chen does not specifically disclose a system ... wherein the predetermined criterion includes whether the video object shape is substantially circular. However, Sekiguchi teaches a system where the substantial roundness ... of a video object shape can be determined. Therefore, it would have been obvious ... to incorporate Sekiguchi's teaching into Chen's video encoding system ... for efficiently encoding of image features in an accurate, high quality manner." (see Final Office Action, last paragraph, page 9- first paragraph, page 10).

Difference Between the Claimed Invention and the Cited References

The present invention, as recited in claim 6, which is typical of the subject matter recited in claims 16 and 25, ultimately depends from claim 1. As remarked above, claim 1 discloses a system reciting an element for "generating one of a plurality of mask types," which Chen fails to teach or disclose.

Sekiguchi discloses a feature coding unit that extracts and encodes a feature of a video signal to generate a feature stream. In one embodiment, shown in Figure 2, and described, in part, in col. 14, line 46-60, which is referred-to in the Final Office Action, Sekiguchi discloses that video content 111 is provided to a search processor 9 and the parameters used by the search processor 9 may "include color information, such as 'blue' and 'red', brightness information, relative area of segment, shape information (such as 'round' or 'rectangular') of the segment."

No Motivation Exists for the
Examiner's Proposed Modification

Contrary to the statements made in the Final Office Action, there is no motivation to develop the features of the present invention from the teachings of Chen and Sekiguchi.

The law is clear that there must be some teaching in the reference to support their use in the particular claimed combination. See Smithkline Diagnostics, Inc., v. Helena Labs Corp., 859 F.2d 878, 887, 8 USPQ 2d 1468, 1475 (Fed. Cir. (1988).

As remarked above, Chen discloses isolating a video object using a bounding box and determining the object shape within the bounding box by determining which pixels are located within the object and which pixels are located outside the object to identify

the original shape of the object. Sekiguchi discloses providing search criteria to a search processor that uses the provided criteria to determine the object shape.

However, nothing in Chen teaches or suggests using criterion other than the "object texture (luminance and chrominance value)" (see col. 4, lines 30-31) in the bounding box to determine the object shape.

In fact, the use of a circular criterion in the Chen device would increase the processing required to determine the object shape. For example, if the inputted circular criteria were used as the bounding box to isolate the object, then additional computations are necessary to determine which set of the primarily square (e.g., 16x16 pixel) macroblocks are contained in the circular bounding box. Similarly, if the circular criteria is used in addition to the textual criteria to determine the object shape, then additional computations are necessary to determine which of the individual macroblocks border the object. Chen, in Figure 3, illustrates the problem of using a circular search criteria in referring to a single macroblock with a highlighting circle 320. Hence, a circular criterion would encompass areas of surrounding macroblocks which require additional processing to remove the surrounding areas. Chen, in Figure 4, illustrates further the advantages of using an essentially square or rectangular bounding box as individual macroblocks can be evenly encompassed in the bounding box without additional computation.

Accordingly, because the use a circular criterion would increase the computational requirements of the processor, one would not be motivated to use a circular search criterion as suggested in the Final Office Action.

Proposed Modification of Chen
Fails to Arrive at the Present Invention

To establish a prima facie case of obviousness of a claimed invention, all the claim limitations must be taught or suggested in the prior art. See *In re* Royka, 490 F. 2d 981, 180 USPQ 580 (CCPA 1975). The proposed modification of Chen fails to establish a prima facie case of obviousness because, even if there were some motivation to develop the feature suggested by the examiner, all of the claim elements are not taught or suggested by the combination of the teachings of the cited references. Rather, the proposed modification fails to generate "one of a plurality of mask types based on an evaluation of the object," as is recited in the independent claims, as both Chen and Sekiguchi are silent with regard to this claim element.

Accordingly, the combination of Chen and Sekiguchi cannot be said to render obvious the invention recited in claim 6, as both Chen and Sekiguchi fail to recite an element recited in the independent claim 1, from which claim 6 depends.

Alternatively, even if the teachings of Chen and Sekiguchi can be combined it can be shown that the combined device would not operate as is claimed. For example, if a circular search criteria were selected by the device of Sekguchi, and a circular object were extracted from a video image by the device of Chen, the combined device would not generate a mask type based on the evaluation of the video object performed by Sekiguchi. Rather, the bounding box is selected independent of the search criteria.

In view of the above remarks, applicant submits that claim 6 is not rendered obvious and patentable over the teachings of Chen and Sekiguchi.

With regard to claims 16 and 25, these claims were rejected citing the same reason used to reject claim 6. However, claims 16 and 25 recite the same subject matter that is recited in claim 6. Accordingly, claims 16 and 25 also include subject matter not disclosed by the combined device of Chen and Sekiguchi and, thus, for the same remarks made with regard to claim 6, cannot be said to have been rendered obvious as suggested in the Final Office Action.

In view of the above, applicant submits that claims 6, 16 and 25 are patentable over the teachings of the cited references.

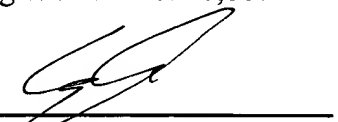
For at least all of the above reasons, the proposed combination of prior art references would not have rendered obvious the present invention.

VIII. CONCLUSION

In view of the above analysis, it is respectfully submitted that the referenced teachings, whether taken individually or in combination, fail to anticipate or render obvious the subject matter of any of the present claims. Therefore, reversal of all outstanding grounds of rejection is respectfully solicited.

Respectfully submitted,

Russell Gross
Registration No. 40,007



Date: March 14, 2005

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IX. APPENDIX: THE CLAIMS ON APPEAL

1. A video object encoding system, comprising:

an object evaluation system that evaluates a video object using a predetermined criterion; and

a mask generation system that generates one of a plurality of mask types for the video object based on the evaluation of the video object.

2. The video object encoding system of claim 1, wherein the plurality of mask types includes a pixel-based mask, a bounding box mask, and a macroblock-based mask.

3. The video object encoding system of claim 1, wherein the predetermined criterion examines a shape of the video object.

4. The video object encoding system of claim 1, wherein the predetermined criterion examines a texture of the video object.

5. The video object encoding system of claim 1, wherein the predetermined criterion examines motion information regarding the video object.

6. The video object encoding system of claim 3, wherein the predetermined criterion includes whether the video object shape is substantially circular.

7. The video object encoding system of claim 3, wherein the predetermined criterion includes whether an area of the video object shape is substantially similar to an area of a generated bounding box.

8. The video object encoding system of claim 7, wherein the predetermined criterion includes whether an area of a macroblock-based shape generated for the video object is substantially similar to the area of the generated bounding box.

9. The video object encoding system of claim 8, wherein the predetermined criterion includes whether the area of a macroblock-based shape is larger than the area of the video object shape.

10. The video object encoding system of claim 1, further comprising an MPEG-4 encoder.

11. A program product stored on a recordable medium, which when executed, encodes video objects, the program product comprising:

program code configured to evaluate a video object using a predetermined criterion; and

program code configured to generate one of a plurality of mask types for the video object based on the evaluation of the video object.

12. The program product of claim 11, wherein the plurality of mask types includes a pixel-based mask, a bounding box mask, and a macroblock-based mask.

13. The program product of claim 11, wherein the predetermined criterion examines a shape of the video object.

14. The program product of claim 11, wherein the predetermined criterion examines a texture of the video object.

15. The program product of claim 11, wherein the predetermined criterion examines motion information regarding the video object.

16. The program product of claim 13, wherein the predetermined criterion includes whether the video object shape is substantially circular.

17. The program product of claim 13, wherein the predetermined criterion includes whether an area of the video object shape is substantially similar to an area of a generated bounding box.

18. The program product of claim 17, wherein the predetermined criterion includes whether an area of a macroblock-based shape generated for the video object is substantially similar to the area of the generated bounding box.

19. The program product of claim 18, wherein the predetermined criterion includes whether the area of a macroblock-based shape is larger than the area of the video object shape.

20. A method for encoding video objects in an object based video communication system, comprising the steps of:

evaluating a video object using a predetermined criterion; and

generating one of a plurality of mask types for the video object based on the evaluation of the video object.

21. The method of claim 20, wherein the plurality of mask types includes a pixel-based mask, a bounding box mask, and a macroblock-based mask.

22. The method of claim 20, wherein the predetermined criterion examines a shape of the video object.

23. The method of claim 20, wherein the predetermined criterion examines a texture of the video object.

24. The method of claim 20, wherein the predetermined criterion examines motion information regarding the video object.

25. The method of claim 22, wherein the evaluating step includes determining if the shape is substantially circular.

26. The method of claim 22, wherein the evaluating step includes:

generating a bounding box; and

determining if an area of the object shape is substantially similar to an area of the generated bounding box.

27. The method of claim 26, wherein the evaluating step includes:

generating a macroblock-based shape; and

determining whether an area of the macroblock-based shape is substantially similar to the area of the generated bounding box.

28. The method of claim 27, wherein the evaluating step includes determining whether the area of a macroblock-based shape is larger than the area of the object shape.